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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/529,818	03/31/2005	Hiroshi Matsui	Q87174	5691

23373 7590 06/18/2010

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EXAMINER	
MOWLA, GOLAM	

ART UNIT	PAPER NUMBER
1795	

NOTIFICATION DATE	DELIVERY MODE
06/18/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/529,818	MATSUI ET AL.	
	Examiner	Art Unit	
	GOLAM MOWLA	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 April 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,6,27-29 and 34* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,6,27-29 and 34* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *06/04/2010*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application.
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 04/26/2010 has been entered.

Response to Amendment

2. Applicant's amendment of 04/26/2010 does not place the Application in condition for allowance.

3. Claims 1-2, 6, 27-29 and 34 are currently pending. Applicant has amended claims 1, 6, 27 and 34, and cancelled claims 3-5, 7-26 and 30-33.

Status of the Objections or Rejections

4. Due to Applicant's amendment to claims 1, 6, 27 and 34, all rejections from the office Action dated 12/24/2009 are withdrawn. However, upon further consideration, a new ground of rejection is presented below.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 1-2, 6, 27-29 and 34 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claims 1, 6, 27 and 34 recite the limitation "the transparent conductive layer contacts an electrolyte solution via the oxide semiconductor porous film outside of the insulating layer" which is not supported by the original disclosure as filed.

Claim Rejections - 35 USC § 103

7. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

8. Claims 1-2 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kurth (WO00/48212, refer to US 6462266 for translation) in view of Yoshikawa (US 2002/0040728 A1).

Regarding claims 1-2 and 6, Kurth discloses a photovoltaic cell (1) (fig. 1, 2:26-3:3 and 4:53-63), which reads on instant photoelectric conversion element or dye-sensitized solar cell, comprising:

- an electrode substrate, comprising
  - a base material (support pane 2),
  - a transparent conductive layer (conductor layer 5) which is provided on the base material (2), and

- a metal circuit layer (conductor lead 7) which is formed on the transparent conductive layer (5),
  - wherein the metal circuit layer (7) is covered by an insulating layer (insulating coating 10) that includes a glass component (glass coating 10) (col. 2, line 45);

- a counter electrode (conductive layer 6), which has a different constitution from the electrode substrate (counter electrode is formed of a single layer 6 whereas electrode substrate is made of plurality of layers, and therefore has a different constitution), and which is placed facing an oxide semiconductor film (inherent characteristics feature of a photovoltaic cell); and
- an electrolyte layer or charger transfer layer (col. 4, lines 53-63) that is provided between the counter electrode (6) and the electrode substrate (combination of layers 2+5+7+10) (one of ordinary skill in the art realizes that the electrolyte layer is inherently placed between the electrode substrate and counter electrode).

The dye-sensitized solar cell (1) of Kurth inherently has a dye-sensitized semiconductor film which is provided between the electrode substrate (combination of layers 2+5+7+10) and counter electrode (6) (see figure 1-10 of Yoshikawa which shows that dye-sensitized semiconductor layer is inherently formed between electrode substrate and counter electrode). However Kurth does not explicitly show whether the dye-sensitized semiconductor film comprises a semiconductor porous film that is

provided on a side of the electrode substrate above which the transparent conductive layer side is provided, and a sensitizing dye that is provided in the semiconductor porous film, and whether the semiconductor porous film is formed above the electrolyte layer.

Yoshikawa discloses a photoelectric conversion element or dye sensitized solar cell (see fig. 1-10) ([0069]) comprising an electrode substrate (50a and 10a), a counter electrode (40a), a porous semiconductor film (20) ([0085]), a sensitizing dye (22) in the oxide semiconductor porous film (20) (see fig. 1-10) ([0069]), and an electrolyte (30) adjacent to the oxide semiconductor porous film (20) provided between the counter electrode (40a) and the electrode substrate (50a and 10a) above which oxide semiconductor porous film (20) is formed.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized the configuration and the dye-sensitized semiconductor porous film of Yoshikawa in the solar cell of Kurth in order to form the porous semiconductor film and the electrolyte layer above the electrode substrate and between the electrode substrate and counter electrode in order to allow for a device that exhibits excellent conversion efficiency, as taught by Yoshikawa ([0004-0005]).

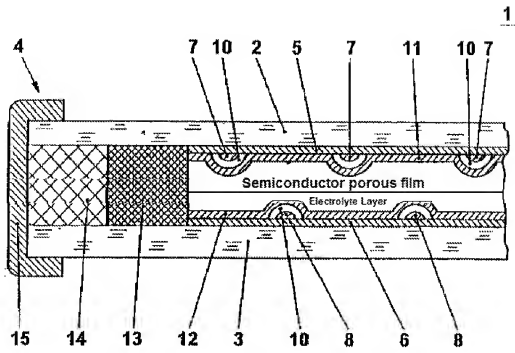

Figure 1: Photovoltaic cell of Kurth in view of Yoshikawa

Hence, Kurth in view of Yoshikawa discloses the transparent conductive layer (5) contacts the metal circuit layer (7) inside of the insulating layer (10) and the transparent conductive layer (5) contacts an electrolyte solution (col. 4, lines 53-63) via the oxide semiconductor porous film outside of the insulating layer (10) (see fig 1 as shown above).

9. Claims 27-29 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kurth (WO00/48212, refer to US 6462266 for translation) in view of Yoshikawa (US 2002/0040728 A1), and further in view of Mohri et al (US 4396682).

Regarding claim 27-29 and 34, Kurth discloses a photovoltaic cell (1) (fig. 1, 2:26-3:3 and 4:53-63), which reads on instant photoelectric conversion element or dye-sensitized solar cell, comprising:

- an electrode substrate, comprising
  - a base material (support pane 2),
  - a transparent conductive layer (conductor layer 5) which is provided on the base material (2), and
  - a metal circuit layer (conductor lead 7) which is formed on the transparent conductive layer (5),
    - wherein the metal circuit layer (7) is covered by an insulating layer (insulating coating 10) that includes a glass component (glass coating 10) (col. 2, line 45);
- a counter electrode (conductive layer 6), which has a different constitution form the electrode substrate (counter electrode is formed of a single layer 6 whereas electrode substrate is made of plurality of layers, and therefore has a different constitution), and which is placed facing an oxide semiconductor film (inherent characteristics feature of a photovoltaic cell); and
- an electrolyte layer or charger transfer layer (col. 4, lines 53-63) that is provided between the counter electrode (6) and the electrode substrate (combination of layers 2+5+7+10) (one of ordinary skill in the art realizes

that the electrolyte layer is inherently placed between the electrode substrate and counter electrode).

The dye-sensitized solar cell (1) of Kurth inherently has a dye-sensitized semiconductor film which is provided between the electrode substrate (combination of layers 2+5+7+10) and counter electrode (6) (see figure 1-10 of Yoshikawa which shows that dye-sensitized semiconductor layer is inherently formed between electrode substrate and counter electrode). However Kurth does not explicitly show whether the dye-sensitized semiconductor film comprises a semiconductor porous film that is provided on a side of the electrode substrate above which the transparent conductive layer side is provided, and a sensitizing dye that is provided in the semiconductor porous film, and whether the semiconductor porous film is formed above the electrolyte layer.

Yoshikawa discloses a photoelectric conversion element or dye sensitized solar cell (see fig. 1-10) ([0069]) comprising an electrode substrate (50a and 10a), a counter electrode (40a), a porous semiconductor film (20) ([0085]), a sensitizing dye (22) in the oxide semiconductor porous film (20) (see fig. 1-10) ([0069]), and an electrolyte (30) adjacent to the oxide semiconductor porous film (20) provided between the counter electrode (40a) and the electrode substrate (50a and 10a) above which oxide semiconductor porous film (20) is formed. Yoshikawa further discloses that the transparent conductor (10a) contacts an electrolytic solution (23) via the oxide semiconductor porous film (20).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized the configuration and the dye-sensitized semiconductor porous film of Yoshikawa in the solar cell of Kurth in order to form the porous semiconductor film and the electrolyte layer above the electrode substrate and between the electrode substrate and counter electrode in order to allow for a device that exhibits excellent conversion efficiency, as taught by Yoshikawa ([0004-0005]).

Hence, Kurth in view of Yoshikawa discloses the transparent conductive layer (5) contacts the metal circuit layer (7) inside of the insulating layer (10) and the transparent conductive layer (5) contacts an electrolyte solution (col. 4, lines 53-63) via the oxide semiconductor porous film outside of the insulating layer (10) (see fig 1 as shown above).

Kurth further discloses that the insulating layer coating comprises glass coating (col. 2, line 45). However, the reference is silent as to whether the insulating layer coating includes at least one of alumina, zirconia and silica heat-resistant ceramic, and whether the insulating layer contains at least one of silicate, phosphate, colloidal silica, alkyl silicate, and metal alkoxide.

Mohri teaches an insulating layer (glazed ceramic substrate) for use in electronic device comprises a heat-resistant ceramic (alumina) as a main component and further includes colloidal silica (SiO_2) (see abstract, and col. 2, line 26 to col. 3, line 55).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized the insulating coating layer of Mohri in the solar cell of Kurth in view of Yoshikawa because the insulating layer of Mohri has excellent high-

temperature stability (see abstract of Mohri), and also selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945).

Response to Arguments

10. Applicant's arguments with respect to claims 1-2, 6, 27-29 and 34 have been considered but are moot in view of the new ground(s) of rejection as necessitated by the amendments.

Applicant argues that the constitutions of the electrode substrate and the counter substrate in Kurth are the same and therefore Kurth does not teach the claims as recited, i.e., Kurth does not disclose a counter electrode, which has a different constitution from the electrode substrate (see Remarks, page 8).

The Examiner respectfully disagrees. The claims as recited require a counter electrode to have a different constitution from the electrode substrate, not the counter electrode substrate as argued by the Applicant. Kurth explicitly teaches a counter electrode (conductive layer 6) is formed of a single layer 6 whereas the electrode substrate is made of a base material (support pane 2), a transparent conductive layer (conductor layer 5) which is provided on the base material (2), a metal circuit layer (conductor lead 7) which is formed on the transparent conductive layer (5), and an insulating layer (insulating coating 10) covering the metal circuit layer (7). Therefore, the counter electrode (6) has a different constitution form the electrode substrate (2+5+7+10).

Applicant also argues that Kurth in view of Yoshikawa does not disclose the transparent conductive layer contacts an electrolyte solution via the oxide semiconductor porous film outside of the insulating layer (see Remarks).

The Examiner respectfully disagrees. Kurth in view of Yoshikawa discloses the transparent conductive layer (5) contacts the metal circuit layer (7) inside of the insulating layer (10) and the transparent conductive layer (5) contacts an electrolyte solution (col. 4, lines 53-63) via the oxide semiconductor porous film outside of the insulating layer (10) (see fig 1 as shown above).

Correspondence/Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GOLAM MOWLA whose telephone number is (571) 270-5268. The examiner can normally be reached on M-Th, 0800-1830 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, ALEXA NECKEL can be reached on (571) 272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/G. M./
Examiner, Art Unit 1795

/Keith Walker/
Primary Examiner, Art Unit 1795